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Presentation Abstract

Title **The Near-Earth Encounter of Asteroid 308635 (2005 YU55): Thermal IR Observations**

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Abstract The near-Earth approach (0.00217 AU, or 0.845 lunar distances) of the C-type asteroid 308635 (2005 YU55) in November 2011 presented a rare opportunity for detailed observations of a low-albedo NEA in this size range. As part of a multi-telescope campaign to measure visible and infrared spectra and photometry, we obtained mid-infrared (~8 to 22 micron) photometry and spectroscopy of 2005 YU55 using Michelle [1] on the Gemini North telescope on UT November 9 and 10, 2011. An extensive radar campaign [2] together with optical lightcurves [3,4] established the rotation state of YU55. In addition, the radar imaging resulted in a shape model for the asteroid, detection of numerous boulders on its surface, and a preliminary estimate of its equatorial diameter at 380 +/- 20 m. In a preliminary analysis, applying the radar and lightcurve-derived parameters to a rough-surface thermophysical model fit to the Gemini/Michelle thermal emission photometry results in a thermal inertia range of approximately 500 to 1500 J m⁻² s^{-1/2} K⁻¹, with the low-thermal-inertia solution corresponding to the small end of the radar size range and vice versa. Updates to these results will be presented and modeling of the thermal contribution to the measured near-infrared spectra from Palomar/Triplespec and IRTF/SpeX will also be discussed. The authors gratefully acknowledge the assistance of observatory staff and the support of the NASA NEOO program (LFL and JPE), the Carnegie fellowship (NAM), and NASA AES, NSF, and the NRAO Jansky Fellowship (MWB). [1] De Buizer, J. and R. Fisher, Proc. Hris (2005), pp. 84-87. [2] Busch, M.W. et al., ACM (2012), abstract #6179. [3] Warner, B., MPBull 39 (2), 84 [4] Pravec, P.